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Arnab Das

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CAPITOL PATENT & TRADEMARK LAW FIRM, PLLC

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VIENNA, VA 22183

EXAMINER

MERED, HABTE

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|-----------------------------------|--|
| Office Action Summary | Application No. 09/982,317 | Applicant(s) DAS ET AL. | |
| | Examiner HABTE MERED | Art Unit 2474 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8,11-14 and 17-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8,11-14 and 17-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/18/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 9/27/2010 has been entered.
2. Claims 1-6, 8, 11-14, and 17-19 are pending. The base independent claims are 1 and 14. Claims 1 and 14 are amended.

Information Disclosure Statement

3. The Information Disclosure Statement (IDS) submitted on 9/27/2010 is acknowledged. However, Japanese Patent Application 2001-062742 has not been considered due to lack of translation of the document in question.

Response to Arguments

4. Applicant's arguments with respect to claims 1-6, 8, 11-14, and 17-19 have been considered but are moot in view of the new ground(s) of rejection based Odenwalder US 7,1 67,461.

Odenwalder '461 discloses the newly amended limitation requiring different and separate control channel for each transmission. Odenwalder '461 like Applicant's teaching takes a dedicated control channel like S-PDCCH and further channelizes it using code division multiplexing (CDM) to obtain unique, different and separate control channel for each end user to control/decode its own transmission on the Forward-Packet Data Channel for each transmission directed to the end user. Applicant should realize that just like Applicant's Figs 1 and 2 Odenwalder US 7,1 67,461 establishes that the S-PDCCH control channel can be further channelized into different CDM channels to correspond to different transmissions in the F-PDCH.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-5, 8, 11-14, and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry et al (US 6, 996, 082) in view of Odenwalder (US 7, 167, 461 B2) and Odenwalder et al (US 6, 804, 220).

Regarding **claim 1**, Terry '082 discloses a method for transmitting information in a communication channel of a wireless communication system (**Figure 1, Column 6:25-35**), the method comprising: dividing the communication channel into a plurality of time slots of equal duration; (**See Figure 4 S1...S12 are timeslots and CDMA codes**

0...15 defining the sub-slots as further illustrated in Column 2:60-67) and sub-dividing, on other than a time division basis (Sub-slots divided on the basis of CDMA codes), each of the plurality of time slots to comprise two or more sub-slots (In Figure 4 each time slot contains 16 sub-slots), and transmitting at least one transmission, among a number of transmissions, that comprises a number of contiguous sub-slots associated with at least two time slots, where the number of sub slots included in the transmission from each time slot may vary from time slot to time slot within each transmission (See Figure 15, each timeslot S1...S12 is sub-divided into 16 sub slots using code 0...15. It is clear from Figure 15 UE A for instance for a single transmission uses time slots 5, 6, and 7 and each time slot has different number of sub-slots. For instance UE A in time slot 5 uses 12 sub-slots and in time slot 6 uses 16 sub slots and in time slot 7 uses 3 sub slots. The transmission associated with UE C also adequately addresses this limitation – see also Column 6, Lines 10)

Terry '082 fails to disclose a method of transmitting a separate, different control channel for each separate transmission.

However, the above mentioned claimed limitations are well known in the art as evidenced by Odenwalder '461. In particular, Odenwalder '461 discloses a method of transmitting a separate, different control channel (i.e. **CDM channel for a subscriber** Column 9, Lines 9-12 and Fig. 6 CDM channels 608(i)) for each separate transmission (i.e. **Based on info in the CDM control channel the subscriber decodes and processes the unique transmission on the F-PDCH (Forward Packet**

Data channel) in the form of F-PDCH sub-packet – See Column 9, Lines 1-3, 9-12, 2--30. See also Column 4, lines 63-67, Figs. 5, 8, and 10 and Column 10, Lines 40-46, Column 11, Lines 15-20, Column 12, Lines 35-50, and Column 13, Lines 10-15).

In view of the above, having the method of Terry '082 and then given the well established teaching of Odenwalder '461, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the method of Terry '082 as taught by Odenwalder '461, since Odenwalder '461 discloses the modification results in improving the throughput of the modified system by allowing multiple forward link transmissions per slot (See Odenwalder '461 Column 4, Lines 45-46).

Terry '082 as modified by Odenwalder '461 fails to expressly disclose a method wherein the duration of the separate control channel is dependent upon the number of transmitted sub-slots.

Odenwalder '461 discloses in Column 4, Lines 5-7 that the control packet (i.e. F-PPDCH) contains 2-bit field to indicate the length of the transmission of F-PDCH and in Column 13, Line 14 it states the packet/transmission size of the encoded F-PDCH packet is included in the control channel and it is clear that to one ordinarily skilled art to indicate a larger transmission/packet size as opposed to a smaller size in the control packet the duration of the control packet transmission will be greater when indicating the larger transmission/packet size as opposed to the smaller size as more bits are used in the control packet to indicate the larger transmission/packet size.

Odenwalder '220 discloses a method wherein the duration of the separate control channel (**F-SPDDC – Column 6, Lines 9-12**) is dependent upon the number of (**i.e. corresponding data sub-packets – Column 6, Lines 1-4 and 12-14**) transmitted sub-slots (**See Column 5, Lines 60-67; Column 6, Lines, 1-4, 9-20 and 21-26**).

In view of the above, having the method of Terry '082 as modified by Odenwalder '461 and then given the well established teaching of Odenwalder '220, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the method of Terry '082 as modified by Odenwalder '461 as taught by Odenwalder '220, since Odenwalder '220 discloses the modification results in use of control channel technique that reduces overhead and increases system resources for user data traffic since no additional new CDMA/Walsh codes will be needed to prevent interference in the different sub-slots associated with different transmission in the control channel. (See Odenwalder '220 in Column 1, Lines 53-67).

Regarding **claims 2**, Terry '082 discloses a method, wherein each of the two or more contiguous sub-slots is separately transmitted according to a code division multiple access schemes. (**See Columns 2, Lines 64-67 and Column 3, Lines 1-10**)

Regarding **claim 3**, Terry '082 discloses a method wherein, in any one of the plurality of time slots, each of a plurality of transmissions are separately coded and carried in a separate sub-slot simultaneously in such time slot. (**See Columns 2, Lines 64-67 and Column 3, Lines 1-10**)

Regarding **claim 4**, Terry '082 discloses a method wherein each of the plurality of transmissions corresponds to a separate user of the wireless communication system.

(See Figures 4-10, UE A, UE B, UE C are separate users. See Columns 2, Lines 64-67 and Column 3, Lines 1-10)

Regarding **claim 5**, Terry '082 discloses a method wherein each off the plurality of transmissions corresponds to separate transmissions of a single user of the wireless communication system. **(See Figures 4-10, UE A, UE B, UE C are separate users with multiple sub-slots transmission. See Columns 2, Lines 64-67 and Column 3, Lines 1-10)**

Regarding **claim 8**, Terry '082 discloses a method, wherein the communication channel comprises time slots each having duration of 1.25 milliseconds and wherein each of the time slots comprises at least two sub-slots. **(Terry '082 discloses in Figure 5B and further on Column 6, Lines 39-43 that each time slot can have several sub-channels. There is no restriction imposed on the duration of the time slot and can readily be 1.25 milliseconds and 1.25 millisecond duration is standard for TDMA systems.)**

Regarding **claim 11**, the combination of Terry '082, Odenwalder '461, and Odenwalder '220 disclose a method wherein the communication channel is a forward packet data channel (F-PDCH), wherein information is transmitted as encoder packets in the forward packet data channel (F-PDCH), and wherein the separate control channel is a forward secondary packet data control channel (SPDCCH). **(See Odenwalder '220 Column 5, Lines 60-67; Column 6, Lines 9-20, and 21-35 and Odenwalder '461 Column 4, Lines 5-20 and Column 7, Lines 50-67)**

Regarding **claim 12**, the combination of Terry '082, Odenwalder '461, and Odenwalder '220 discloses a method, wherein the forward secondary packet data control channel (SPDCCH) includes:

a sub-slot start field (**i.e. starting sub-slot 910(i)**) for identifying a sub-slot within a time slot in which a particular transmission starts (**i.e. Odenwalder '461 See Column 12, Lines 12-15**); and

a sub-slot count field (**i.e. the encoder packet size – Odenwalder '461 Column 13, Line 14**) for identifying the total number of sub-slots that carry the particular transmission (**See Odenwalder '461 Column 8, Lines 55-57, Column 9, Lines 46-58, Column 13, Line 14**) .

Regarding **claim 13**, the combination of Terry '082, Odenwalder '461, and Odenwalder '220 discloses a method, wherein a plurality of forward secondary packet data control channels (SPDCCH) (**i.e. Odenwalder '461 plurality of CDM control channels 900(i)**) correspond to a plurality of simultaneous transmissions on the forward packet data channel (F-PDCH) (**see Odenwalder '461 Column 11, Lines 55-67**), and wherein each of the plurality of secondary packet data control channels (SPDCCH) (**i.e. Odenwalder '461 CDM control channel 900(i)**) identifies a sub-slot start position (**i.e. Odenwalder '461 Column 12, Line 7 - sub-slot 910(i)**) within a time slot in which a particular transmission starts (**See Odenwalder '461 Column 11, Lines 55-67 and Column 12, Lines 1-20**).

Regarding **claim 14**, Terry '082 discloses a method for transmitting information in a communication channel of a wireless communication system (**Figure 1, Column 6**,

Lines 25-35), the method comprising: dividing the communication channel into a plurality of time slots of equal duration according to a time division multiple access scheme **(See Figure 4 S1...S12 are timeslots (TDMA system) and CDMA codes 0...15 defining the sub-slots as further illustrated in Column 2, Lines 60-67)** and sub-dividing each of the plurality of time slots to comprise two or more sub-slots according to CDMA scheme **(See Column 3, Lines 1-5)**; transmitting at least one transmission, among a number of transmissions, that comprises a number of contiguous sub-slots associated with at least two time slots, where the number of sub slots included in the transmission from each time slot may vary from time slot to time slot within each transmission. **(See Figure 15, each timeslot S1...S12 is sub-divided into 16 sub slots using code 0...15. It is clear from Figure 15 UE A for instance for a single transmission uses time slots 5, 6, and 7 and each time slot has different number of sub-slots. For instance UE A in time slot 5 uses 12 sub-slots and in time slot 6 uses 16 sub slots and in time slot 7 uses 3 sub slots. The transmission associated with UE C also adequately addresses this limitation)**

Terry '082 fails to disclose a method of transmitting a separate, different control channel for each separate transmission.

However, the above mentioned claimed limitations are well known in the art as evidenced by Odenwalder '461. In particular, Odenwalder '461 discloses a method of transmitting a separate, different control channel **(i.e. CDM channel for a subscriber Column 9, Lines 9-12 and Fig. 6 CDM channels 608(i))** for each separate transmission **(i.e. Based on info in the CDM control channel the subscriber**

decodes and processes the unique transmission on the F-PDCH (Forward Packet Data channel) in the form of F-PDCH sub-packet – See Column 9, Lines 1-3, 9-12, 2--30. See also Column 4, lines 63-67, Figs. 5, 8, and 10 and Column 10, Lines 40-46, Column 11, Lines 15-20, Column 12, Lines 35-50, and Column 13, Lines 10-15).

In view of the above, having the method of Terry '082 and then given the well established teaching of Odenwalder '461, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the method of Terry '082 as taught by Odenwalder '461, since Odenwalder '461 discloses the modification results in improving the throughput of the modified system by allowing multiple forward link transmissions per slot (See Odenwalder '461 Column 4, Lines 45-46).

Terry '082 as modified by Odenwalder '461 fails to expressly disclose a method wherein the duration of the separate control channel is dependent upon the number of transmitted sub-slots.

Odenwalder '461 discloses in Column 4, Lines 5-7 that the control packet (i.e. F-PPDCH) contains 2-bit field to indicate the length of the transmission of F-PDCH and in Column 13, Line 14 it states the packet/transmission size of the encoded F-PDCH packet is included in the control channel and it is clear that to one ordinarily skilled art to indicate a larger transmission/packet size as opposed to a smaller size in the control packet the duration of the control packet transmission will be greater when indicating the larger transmission/packet size as opposed to the smaller size as more bits are used in the control packet to indicate the larger transmission/packet size.

Odenwalder '220 discloses a method wherein the duration of the separate control channel (**F-SPDDC – Column 6, Lines 9-12**) is dependent upon the number of (**i.e. corresponding data sub-packets – Column 6, Lines 1-4 and 12-14**) transmitted sub-slots (**See Column 5, Lines 60-67; Column 6, Lines, 1-4, 9-20 and 21-26**).

In view of the above, having the method of Terry '082 as modified by Odenwalder '461 and then given the well established teaching of Odenwalder '220, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the method of Terry '082 as modified by Odenwalder '461 as taught by Odenwalder '220, since Odenwalder '220 discloses the modification results in use of control channel technique that reduces overhead and increases system resources for user data traffic since no additional new CDMA/Walsh codes will be needed to prevent interference in the different sub-slots associated with different transmission in the control channel. (See Odenwalder '220 in Column 1, Lines 53-67).

Regarding **claim 17**, Terry '082 discloses a method, wherein bandwidth in the communication channel is allocated on a fractional basis to carry a plurality of transmissions using a combination of a variable number of contiguous sub-slots and a variable number of contiguous time slots. (**See Terry '082 Figures 4-8 and 13, See Columns 2:64-67 and 3:1-10**)

5. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Terry '082 in view of Odenwalder '461 and Odenwalder '220 as applied to claim 1 above, and further in view of Toskala et al (US 6, 535, 503).

The combination of Terry '082, Odenwalder '461, and Odenwalder '220, teach all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method, wherein each of the two or more sub-slots within a particular time slot corresponds to a different frequency according to a frequency division multiple access (FDMA) scheme.

However, the above mentioned claimed limitations are well known in the art as evidenced by Odenwalder '461. In particular, Toskala shows that TDMA/FDMA is feasible and further discloses a method, wherein each of the two or more sub-slots within a particular time slot corresponds to a different frequency according to a frequency division multiple access (FDMA) schemes. **(See Column 1, Lines 40-50)**

It would have been obvious to one of ordinary skill in the art at the time of invention to practice FDMA/TDMA access in the method based on the combination of Terry '082, Odenwalder '461, and Odenwalder '220 wherein each of the two or more sub-slots within a particular time slot corresponds to a different frequency according to a frequency division multiple access (FDMA) schemes. The modification of the combination of Terry '082, Odenwalder '461, and Odenwalder '220 by Toskala results in efficient use of the frequency spectrum (See Toskala Column 1, Lines 15-16). One also is motivated to use TDMA/FDMA in GSM systems as it is widely used in the international wireless market and GSM access method is based on both FDMA and TDMA.

6. **Claims 18 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Terry '082 in view of Odenwalder '461 and Odenwalder '220 as applied to claim 1 above, and further in view of Malkamaki et al (US 5, 577, 024), hereinafter referred to as Malkamaki.

Regarding **claim 18**, the combination of Terry '082, Odenwalder '461, and Odenwalder '220 teaches all aspect of the claimed invention as set forth in the rejection of claim 1 but fails to disclose a method wherein transmissions within the communication channel include two or more transmissions selected from the group consisting of new transmissions, retransmissions, acknowledgements (ACKs), negative acknowledgements (NACKs), and multi-level ACK/NACK messages.

Malkamaki discloses a method wherein transmissions within the communication channel include two or more transmissions selected from the group consisting of new transmissions, retransmissions, acknowledgements (ACKs), negative acknowledgements (NACKs), and multi-level ACK/NACK messages. **(See Column 1, Lines 19-35; Column 3, Lines 65-67; and Column 4, Lines 1-17; Since Malkamaki's system supports ARQ and also like Terry '082's system allows sub-slots in a given time slot, it is possible to have 4 users sharing the time slot. Each user in the sub-slot can be sending new transmission, Acks, Nacks and multi-level ACK/NACK).**

In view of the above, having the method of Terry '082 as modified by Odenwalder '461 and Odenwalder '220 and then given the well established teaching of Malkamaki, it would have been obvious to one having ordinary skill in the art at the time of the

invention was made to modify the method of Terry '082 as modified by Odenwalder '461 and Odenwalder '220 as taught by Malkamaki, since Malkamaki discloses the modification results in incorporating orthogonal ARQ transmission in a system like Terry '082's there by minimizing collisions of signals transmitted less frequently like Acknowledgment messages (See Malkamaki Column 2, Lines 57-60 and Column 3, Lines 15-18).

Regarding **claim 19**, the combination of Terry '082, Odenwalder '461, Odenwalder '220 and Malkamaki discloses a method, wherein a multi-level ACK/NACK message (**Malkamaki Column 8, Lines 45-50 in the same time slot several ACK frequency channels**) corresponds to multiple transmissions that end within the same time slot. (**See Malkamaki Column 1, Lines 19-35; Column 3, Lines 65-67; and Column 4, Lines 1-17; Malkamaki's system supports ARQ in an environment where multiple transmission within the same environment is allowed.**)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HABTE MERED whose telephone number is (571)272-6046. The examiner can normally be reached on Monday to Friday 10:30AM to 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Aung S. Moe can be reached on 571 272 7314. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Habte Mered/
Examiner, Art Unit 2474